## REMARKS/ARGUMENTS

With this Amendment, claims 1, 2, 3, 12, 16, and 21 are amended herein and Applicant cancels claims 30, 35 and 40 without prejudice or disclaimer. Claims 1-10, 12-29, 31-34, 36-39 and 41-44 are all the claims currently pending in the application. Based on the foregoing amendments and the following remarks, Applicant respectfully requests reconsideration of the application and allowance of the claims.

### I. Rejection of Claims 1-10, 16-17, 21-23, 30, 35 & 40 Under 35 U.S.C. § 103(a)

Claims 1-10, 16-17, 21-23, 30, 35 and 40 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over by Kadous (U.S. Pat. No. 6,636,568; hereinafter "Kadous"), in view of Thielecke, et al. (U.S. Pat. Publ. No. 2003/0003863; hereinafter "Thielecke").

Claim 1, as herein amended, recites *inter alia*, "[a]n apparatus comprising: a first mapper ... and a second mapper ... The "second mapper configured to map the second representations of the communication data into second mapped values according to a second mapping scheme". "[T]he second mapping scheme exhibiting a mapping property that differs with the first mapping scheme". "[T]he first mapper is configured to transmit the first mapped values to a first antenna transducer among a plurality of antenna transducers and ... the second mapper is configured to transmit the second mapped values to a second antenna transducer among the plurality of antenna transducers". "[T]he first and second antenna transducers receive and transduce only the first mapped values and the second mapped values, respectively, into electromagnetic form for communication upon a communication channel, and ... the apparatus is configured to define a code comprising a plurality of layers defined over the first antenna transducer and the second antenna transducer." "[T]he apparatus is configured to *form a composite code from each of layers* of *the code*."

As an initial matter, Applicant notes that the recitations of previously submitted claim 30 (and similarly previously submitted claims 35 and 40) are herein incorporated into amended claim 1 (and similarly independent claims 16 and 21). In rejecting the recitations of previously submitted claim 30, the Examiner relied on the combination of Kadous and Thielecke. (See pg. 9 of the Office Action) In particular, the Examiner correctly concedes that Kadous does not teach or suggest all of the features of claim 1. (See pgs. 4 & 9 of the Office Action) Instead, the

Examiner relies on "Section 0055" of Thielecke to make up for the deficiencies of Kadous. (See *id.*) Applicant disagrees and submits that the combination of Kadous and Thielecke is deficient and does not teach or suggest at least all of the recitations of amended claim 1.

In contrast to claim 1, the cited portion and indeed all of Thielecke, alone or in combination with Kadous, at best, discloses a manner in which to determine "link quality" in a "Multiple-input multiple-output (MIMO)" "channel". (paragraphs [0004] & [0032] of Thielecke) In this regard, Thielecke, alone or in combination with Kadous, describes that "[o]ne measure of the link quality per layer ... is the (Shannon) capacity of this layer." (paragraph [0045] of Kadous) As such, Thielecke, alone or in combination with Kadous, at most, explains that "the capacity $C^{(0)}$, $C^{(1)}$, $C^{(2)}$ and $C^{(3)}$ of four layers $L_0$, $L_1$, $L_2$, $L_3$ is controlled by the feed back information" from feedback channel 4 and describes that "the maximum layer capacities are calculated base[d] on the maximum current channel matrix H and the current signal-to-noise ratio SNR." (paragraphs [0044] and [0045] of Thielecke) Thielecke, alone or in combination with Kadous also describes that "[t]he capacity of the first layer $C^{(0)}$ may be determined as follows.

$$C^{(0)} = \log_2\left(\det\left(I + SNR \cdot \underline{H}_B \cdot [G^{(0)} \ldots G^{(3)}] \cdot [G^{(0)} \ldots G^{(3)}]^H \underline{H}_B^H\right)\right) -$$

$$\log_2\left(\det\left(I + SNR \cdot \underline{H}_B \cdot [G^{(1)} \ldots G^{(3)}] \cdot [G^{(1)} \ldots G^{(3)}]^H \underline{H}_B^H\right)\right)$$

And Thielecke explains that "the capacity of the other layers can be obtained in the same manner." (paragraphs [0052] & [0053] of Thielecke)

Paragraph [0055] of Thielecke, alone or in combination, at most, describes that an orthogonal space time block code is used in determining the capacities of the layers. Specifically, paragraph [0055] of Thielecke, alone or in combination, describes that "an orthogonal space-time block code is used ... <u>to build the layers the capacities for four layers</u> are calculated as: $C_{(0)}=1.50$ [bit/symbol], $C_{(1)}=1.94$ [bit/symbol], $C_{(2)}=2.48$ [bit/symbol], $C_{(3)}=3.06$ [bit/symbol]." (emphasis added) In view of the foregoing, Thielecke, alone or in combination with Kadous, at best, explains that orthogonal space-time block code is used to determine the capacity in various layers, namely "Layer **0**, Layer **1**, Layer **2**, and Layer **3**." However, nowhere

in the cited portion or any other portion of Thielecke, alone or in combination Kadous, is there any mention, teaching, suggestion or motivation relating to any apparatus that is configured to form a composite code from each of the layers of the code, as required by amended claim 1. Simply put there certainly is no mention, teaching or suggestion, relating to an apparatus that is configured to add each of the Layers 0, 1, 2, and 3 of a code to form a composite code, as claimed. In contrast to claim 1, using the "STBC" (to quote the Examiner) of Thielecke, alone or in combination Kadous, to determine capacity of individual layers is not tantamount to and does not teach or suggest an apparatus that is configured to form a composite code from each of the layers of the code, as claimed.

Based at least on the foregoing, Applicant submits that the combination of Kadous and Thielecke does not teach or suggest all of the features of claim 1. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of claim 1 and its dependent claims 2-10.

Since claims 16 and 21 contain features that are analogous to, though not necessarily coextensive with, the features recited in claim 1, Applicant respectfully submits that claim 16 and its dependent claim 17 as well as claim 21 and its dependent claims 22-23 are patentable at least for reasons analogous to those submitted for independent claim 1.


## II. Rejection of Claims 12-15 & 18-20 Under 35 U.S.C. § 103(a)

Claims 12-15 and 18-20 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kadous, in view of Thielecke, et al., and in further view of Ketchum (U.S. Pat. No. 6,731,668; hereinafter "Ketchum"). Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the combination of Kadous and Thielecke is deficient vis-à-vis independent claims 1 and 16, and Ketchum does not make up for the deficiencies of the combination of Kadous and Thielecke and is not cited for such. As such, claims 12-15 and 18-20 are patentable at least by virtue of their respective dependencies from independent claims 1 and 16. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of dependent claims 12-15 and 18-20.

## III.   Rejection of Claims 27-29 Under 35 U.S.C. § 103(a)

Claims 27-29 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kadous, in view of Thielecke and further in view of Kammoun, et al. (2003, 4th IEEE Workshop on Signal Processing Advances in Wireless Communication; hereinafter "Kammoun"). Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the combination of Kadous and Thielecke is deficient vis-à-vis independent claims 1, 16 and 21, and Kammoun does not make up for the deficiencies of the combination of Kadous and Thielecke and is not cited for such. As such, claims 27-29 are patentable at least by virtue of their respective dependencies from independent claims 1, 16 and 21. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of dependent claims 27-29.

## IV.   Rejection of Claims 31, 36 & 41 Under 35 U.S.C. § 103(a)

Claims 31, 36 and 41 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kadous, in view of Thielecke, and further in view of Whang, et al. (U.S. Pat. No. 7,292,644; hereinafter "Whang"). Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the combination of Kadous and Thielecke is deficient vis-à-vis independent claims 1, 16 and 21, and Kammoun does not make up for the deficiencies of the combination of Kadous and Thielecke and is not cited for such. As such, claims 31, 36 and 41 are patentable at least by virtue of their respective dependencies from independent claims 1, 16 and 21. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of dependent claims 31, 36 and 41.

## V.   Rejection of Claims 33, 38 & 43 Under 35 U.S.C. § 103(a)

Claims 33, 38, and 43 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kadous, in view of Thielecke and further in view of Wu et al. (U.S. Pat. No. 7,103,326; hereinafter "Wu"). Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the combination of Kadous and Thielecke is deficient vis-à-vis independent claims 1, 16 and 21, and Wu does not make up for the deficiencies of the combination of Kadous and Thielecke and is not cited for such. As such, claims 33, 38 and 43 are patentable at least by virtue of their respective dependencies from independent claims 1, 16 and 21. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of dependent claims 33, 38 and 43.

## VI.    Rejection of Claims 34, 39 & 44 Under 35 U.S.C. § 103(a)

Claims 34, 39 and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kadous, in view of Thielecke, further in view of Li et al. (U.S. Pat. No. 7,068,628; hereinafter "Li") Applicant respectfully traverses this rejection for at least the following reasons.

As discussed above, the combination of Kadous and Thielecke is deficient vis-à-vis independent claims 1, 16 and 21 and Li does not make up for the deficiencies of the combination of Kadous and Thielecke and is not cited for such. As such, claims 34, 39 and 44 are patentable at least by virtue of their respective dependencies from independent claims 1, 16 and 21. Applicant therefore respectfully requests the Examiner to reconsider and withdraw the § 103(a) rejection of dependent claims 34, 39 and 44.

## VII.    Conclusion

In view of the foregoing remarks, Applicant respectfully submits that all of the claims of the present application are in condition for allowance. It is respectfully requested that a Notice of Allowance be issued in due course. Examiner Dean is encouraged to contact Applicant's undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fee

required therefore (including fees for net addition of claims) is hereby authorized to be charged

to Deposit Account No. 16-0605.

Respectfully submitted,

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